

FM 31-27

**PACK ANIMALS IN SUPPORT OF
SPECIAL OPERATIONS**

INITIAL DRAFT

MARCH 1998

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PREFACE

1
2 This manual provides guidance for training selected personnel in the techniques of animal pack transport and for
3 organizing and operating pack animal units. It tries to capture some of the expertise and techniques that have been
4 lost in the Army over the years. The sections on care, feeding, and veterinary medicine compose a considerable
5 portion of the manual; however, this material is not intended as a substitute for veterinary expertise nor will it
6 make a veterinarian out of the reader. Personnel still must have a rudimentary knowledge of anatomy and
7 physiology, common injuries and diseases (particularly of the feet), and feeding and watering to properly care for
8 the animals and avoid abusing them from overloading or overworking.

9 Though many different types of animals can be used for pack transportation, this manual focuses on horses and
10 mules. You cannot learn how to pack by reading about it; there is no substitute for having a horse or mule standing
11 in front of you while you practice putting a pack saddle and load on him. However, the manual is useful for anyone
12 going into an environment where he will have to learn these skills.

13 FM 31-27 is a guide for personnel being employed in a training or combat situation using pack animals. It is not a
14 substitute for training conducted by personnel having hands-on experience with pack animals in the field. As with
15 all manuals, simply reading this material will not make you an expert in the subject matter.

16 The proponent of this publication is the United States Army John F. Kennedy Special Warfare Center and School
17 (USAJFKSWCS), Fort Bragg, NC. Reviewers and users of this manual should submit comments and recommended
18 changes on DA Form 2028 to Commander, USAJFKSWCS, ATTN: AOJK-DT-SFD, Fort Bragg, NC 28307-5000.

19 Unless this publication states otherwise, masculine nouns and pronouns do not refer exclusively to men.

CHAPTER 1

OVERVIEW

The last pack transport unit in the United States Army was deactivated after the Korean War. Before then, pack animals were employed in every war fought by the United States (U.S.) Army. The Army used approximately 350,000 horses and mules during World War I. Unconventional forces in Italy and in Burma used mules during World War II. Mules were also used in Korea.

Since the deactivation of the pack transport units, the Army has relied on air and ground mobility for transporting equipment. Today and throughout the spectrum of conflict, the Army Special Operations Forces (ARSOF) may find themselves involved in operations in unsophisticated environments. In many of these environments, the indigenous population uses pack animal transportation. Therefore, it may not be possible or practical to use air or ground mobility to move supplies and equipment to the desired locations.

The information in this manual is a collection of ideas and techniques from many different sources and individual experiences. Almost every animal packer has a technique that works for him. The techniques discussed in this manual about packing and operating with animals are general. As the reader gains experience, he may develop other techniques. Remember, however, to use the basic packing principles. Beyond that, the ingenuity of the packer is paramount.

PURPOSE

This manual is a guide for select personnel assigned to train personnel and select animals used during the conduct of transport operations using pack animals. It is not meant to be a substitute for trained personnel that have hands-on experience.

The success of pack operations, under extreme weather and terrain conditions, will depend on the selection and training of personnel and animals. The proper and efficient use of available equipment, the sensible care of animals in the field, and the employment of acceptable movement techniques are essential to accomplish the mission. The limited time allowed for this type of training requires consistently high standards of planning, instruction, and supervision.

MISSION

The mission of animal pack transport systems is to extend or replace other transport means in the support of special operations (SO) missions (tactical or strategic). Animal transport systems can greatly increase mission success when hostile elements and conditions require the movement of combat troops and equipment by foot. The animal's capabilities allow the unit to move quicker and with less personnel fatigue.

CAPABILITIES

Pack animals can transport limited quantities of cargo and weapons over any terrain and under virtually any condition passable by an individual on foot. The pack detachment can traverse steep grades and heavily wooded areas without trail preparation and can maintain acceptable speeds under the most extreme conditions.

Over terrain that is not mountainous, carrying approximately 25 percent of their body weight, well-conditioned pack mules or horses may cover 20 or more miles per day. This capability continues indefinitely as long as the animals receive proper care and feed. In mountainous terrain, with no reduction in payload, the mule or horse can travel from 15 to 20 miles per day.

- 1 The **legs** should be short, straight, and powerful. Avoid animals with cowhocks (knock-knees) and animals that are
- 2 toed-in (pigeon-toed) or toed-out. The knees should be straight, broad, and deep. The cannon bones should be
- 3 short, strong, and broad. The fetlocks also should be broad and deep and rounded in appearance. The pasterns
- 4 should be

1 short and strong and have a moderate slope. A long pastern has too great a slope and is weak, which causes the
2 animal to cripple quickly.

3 The **feet** are a critical factor in the animal's ability to perform, stay physically sound, and endure the hardships of
4 packing. Ideally, the horse should stand with its feet at a forty-five to fifty-degree angle to the ground. The size of
5 the foot should be in proportion to the size of the animal. Small feet are often brittle and do not have the base to
6 support a heavy load or absorb concussion. Large feet could cause the animal to be clumsy and awkward. Mules
7 have a tendency to have smaller feet, but this fact does not present a problem. The sole should be slightly concave
8 and the frog prominent, elastic, and tough. Again, when viewed from the front, an animal that is toed-out should
9 be avoided.

10 The **girth** should be deep from the withers to the floor of the body, and the body should be wide and flat. This size
11 indicates ample space for vital organs, such as the heart and lungs. The **barrel** should be large. A large barrel
12 shows a good spread of the ribs that, in turn, give a good load-bearing surface on top.

13 The **back** should be short, strong, and well-muscled. A short back is better equipped to carry a load without
14 sagging. Horses with one less vertebrae than others would be good selections. The back bone should be prominent.
15 A pack animal with a rounded back and ill-defined backbone is difficult to pack so that the load rides properly.
16 Chances are good the load will slip or roll and the unit will waste valuable time repacking the load during
17 movement.

18 The **loin** should be of moderate length, well-muscled, and broad. A long loin will cause weakness at that point.

19 The **croup** should be low and of moderate width and slope. The **hindquarters** should be strong and well-developed
20 to provide power to the animal.

21

22

23 **Figure 2-1. Animal conformation.** 24 **Conformation Defects**

25 In the selection of a pack animal the above criteria are ideal, but many serviceable pack animals have defects in
26 their conformation and still perform well. However, it is better in the long run to avoid animals with many defects.
27 Try to ensure that the larger animals carry the heaviest loads, and the gentle, experienced animals carry the fragile,
28 easily breakable items. The smaller animals or animals with certain conformation defects should be tasked with
29 carrying the light and not so fragile loads.

30

HEALTH AND WELFARE

31 The health and welfare of the pack animal is the major concern of the pack animal handlers in garrison and in the
32 field. Each individual is responsible for the welfare of the pack animals. Whole pack trains have been lost due to
33 poor animal care.

34

Stable Management

35 In an unconventional warfare (UW) scenario the pack animal unit will probably not have the luxury of a
36 permanent or semi-permanent stable facility. However, most of the routines at the stables are applied in the field.

37 The unit commander has command responsibility for stable management and the training of his soldiers. However,
38 subordinate leaders are directly responsible for stable management and the stable routine.

39 Stable management includes the supervision and maintenance of the stables and the other facilities. The
40 subordinate leaders will ensure the grounds and buildings in the stable area are kept as clean and sanitary as
41 available time and labor will allow and that the grounds are reasonably level and well drained. They will also
42 ensure the animals are well-groomed, properly shod, and free of injuries and diseases. Since a large number of
43 animals may be involved in a pack animal unit, subordinate leaders should keep records at the stables on all the
44 assigned animals.

1

Stable Building

2 The design and construction of a stable facility may be limited to the materials at hand. Regardless of the materials
3 used, the stable should provide adequate shelter, good ventilation, and few maintenance requirements. The stable
4 building should provide ready access to the corrals and storage for feed and packing equipment.

5

Stalls

6 Stalls vary in size depending on the average size of the animals, amount of time the animals are expected to spend
7 in the stall, and available space. A 12-foot by 12-foot stall allows freedom for a large horse or mule to maintain fair
8 physical condition during long periods of idleness while confined to stables. Stalls of this size are normally used
9 for recuperation, foaling of mares, and protection in extreme climates. A 10-foot by 10-foot stall is normally
10 satisfactory when animals are in stables only for feeding and rest. To reduce waste in feeding hay and grain, the
11 stalls should be equipped with hayracks and feedboxes. Stall walls must be free of sharp or rough projections and
12 unfinished woodwork. A major concern when dealing with animal care is the construction and maintenance of stall
13 floors. The floors should be level and have good drainage. It should also be resilient to help maintain a healthy
14 condition of the animals' feet and legs. The floor should also be nonabsorptive for cleanliness and sanitation.
15 Earthen floors composed of clay are satisfactory but require continual work to clean, level, and smooth. Rough-
16 finished concrete provides the best type of floor because it is sanitary, is easy to clean, and requires little
17 maintenance. However, a concrete floor having little resilience must be covered with a bedding of straw or hay for
18 cushion. Wooden floors, unless impregnated, are not desirable since they are slippery and unsanitary. Regardless of
19 the floor chosen, a good bed contributes to the comfort and efficiency of the animals. A clean, comfortable bed will
20 induce the animal to lie down and get better rest. It provides a soft surface that will prevent bruising or abrasion of
21 elbows, hocks, and other body parts. It also provides insulation for the body and a comfortable surface for the
22 animal to stand.

Storage

Storage facilities are needed for the protection and security of feed and tack. The facilities should also be convenient to the stables and corral. Feed storage should provide protection from spoilage, rodents, and loose animals and should have feeding equipment. In addition, it should be arranged to minimize time and personnel necessary for feeding. A tack room should be planned for each stable and partitioned from the stall area. It should have facilities for inspection, cleaning, preserving, repair, and storage of all pack and riding saddles, bridles, halters, panniers, and accessories for the unit.

Corrals

The pack animal unit should provide corrals for the animals' free movement and exercise when they are not in use or in the stalls. Make sure the corrals are close and easily accessible to the stables, well drained, and provide good footing. Fill and level, as much as possible, any depressions and heavily traveled areas where water can collect. Set fences at a sufficient height and strength to ensure the safekeeping of the animals. Make sure the fence is free of sharp or rough projections. Provide water troughs or tanks to give animals free access to water and make sure they are large enough to allow the watering of several animals without congestion. Position hayracks and feedboxes at distances where one dominant animal will not receive more feed than another. Establish hitching posts or a picket line to groom and/or pack the animals. Again, make sure the footing at the picket line or hitching posts receives the same special attention as the heavily traveled areas. A foundation of stone with a covering of finely crushed stone or gravel could be laid. In wet climates, this area is located above the level ground. If there is no natural shelter from the sun and adverse weather, provide one for the animals' protection.

Sanitation

Sanitation at the stables and in the field is a continuous process for maintaining the health of both animals and personnel. Stables and corrals must be kept clean to reduce the breeding of flies, which is one of the most serious sanitation problems that lead to disease and infection. The most effective countermeasure for fly control is to remove manure and soiled bedding daily. You should always locate a compost pile away from the immediate vicinity of the stable area or operational base camp. You should brush out all feed boxes daily and scrub them monthly. Always drain and clean the water tanks each week. Only allow the animals belonging to the unit to drink from these tanks.

Also be sure to water any animals suffering from communicable disease from buckets; then thoroughly clean and disinfect the buckets.

FEED AND WATER

The health, condition, and effectiveness of a pack animal directly relate to the type and amount of food being consumed. The pack animal handler determines the amount and types of food by the amount and type of work to be performed. The working animal needs a diet containing more concentrates than the idle animal to supply the fuel for energy and the proteins and minerals for the replacement of tissue and maintenance of condition. Personnel in the pack animal unit need to have a basic knowledge of feed grains and roughage, their characteristics, and geographical availability. This information is also critical for operational planning.

Feed Requirements

The body requires food for growth, repair of body tissue, and energy for movement. It also needs food to maintain body temperature and energy for such vital body functions as circulation, respiration, and digestion. Protein from feeds such as linseed meal, oats, and bran provide for body growth and repair of tissue. Minerals from feeds such as grass, hay, bran, bone meal, and milk are needed for bones. Carbohydrates and fats from feed such as corn, wheat, rye, and oats produce heat and energy or are stored as fat and sugar as an energy food reserve. Bulk feeds such as hay, grass, bran, and oats are necessary for digestion. There is no single food that contains all the required nutrients; therefore, they are combined to obtain the desired nutritional value. Oats are the best grain feed for stabled animals. For animals on pasture, natural grasses come closest to providing all required nutrients. The food value of feed is measured in terms of the amount and proportions of digestible nutrients it supplies.

1 A ration is the feed allowed one animal for twenty-four hours, usually fed in two portions, morning and evening.
 2 The components of a ration depend upon the class and condition of the animals, the work being done, the variety of
 3 available foods, the kind of shelter provided, the climate, and the season. Feed must be selected and combined,
 4 proportionately, to form a balanced ration that consists of proteins, carbohydrates, fats, minerals, and vitamins.
 5 Pack animals cannot thrive on concentrated foods alone. Bulk is absolutely essential if the digestive tract is to
 6 expand and digestion is to be unimpaired. Excessive amounts of proteins or fats and carbohydrates decrease
 7 digestibility of the whole ration. Quantities of feed in one ration vary depending on the amount of idle time the
 8 animals have, work being performed, and availability of the feed. Insufficient feed, particularly bulky feed, causes
 9 loss of conditioning and general weakness and predisposes an animal to disease. More food than the body needs is
 10 wasteful and harmful. It overtaxes the digestive system and may cause either diarrhea, due to irritation, or colic,
 11 due to constipation.

12

Types of Rations

13 There are three basic types of rations that can be used: the garrison ration, the field ration, and the emergency
 14 ration. All three can be altered in quantities and substance depending on conditioning and training taking place,
 15 type and health of the animals, season, and combat situation. Table 2-1 shows a recommended allowance for
 16 garrison and field rations.

17 **Garrison Ration.** It is used at permanent or semipermanent operational bases where the pack animals are fairly
 18 idle. It contains a standard feed allowance of approximately 10 pounds of grain (8 for mules), 14 pounds of hay,
 19 and 5 pounds of bedding. Again, this ration can be increased slightly depending on the animal's condition or the
 20 training taking place.

21 **Field Ration.** The unit uses this ration while it is deployed so the pack animals can maintain condition and
 22 strength during heavy work. The field ration contains an allowance of about 12 pounds of grain (10 for mules), 14
 23 pounds of hay, and no bedding. Such quantities and combinations of feed could cause a logistic problem in a
 24 combat situation and may be altered. If the situation permits, consider pre-position or caching the feed. Another
 25 way to prevent having to carry all the feed is to consider aerial delivery.

Garrison Rations				
Horses	Small	Grain	Hay	Straw
		7 lb	14 lb	5 lb
Mules	Light	10 lb	14 lb	5 lb
	Heavy	12.5 lb	15 lb	5 lb
		8 lb	14 lb	5 lb
Field Rations				
Horses	Small	Grain	Hay	Straw
		9 lb	14 lb	None
Mules	Light	12 lb	14 lb	None
	Heavy	14 lb	16 lb	None
		10 lb	14 lb	None

26

Table 2-1. Recommended ration allowances.

27 **Notes:** 1. Bran may be substituted in amounts not to exceed three pounds for a like amount of grain. One-half
 28 pound of linseed meal may be substituted for one pound of grain.

29 2. The substitution of barley, rice, copra meal or any other local product can be made for the grain ration.

30 3. The substitution of native grasses, bamboo shoots, or banana stalks can be made for the hay ration.

- 1 4. *Fifteen pounds of corn fodder or grain sorghum is considered the equivalent of ten pounds of hay.*

1 **Emergency Ration.** The unit uses this temporary ration for a short time when the combat situation or environment
2 prohibits the use of a field ration. An emergency ration is a modification of a field ration for reasons such as
3 logistic problems or the lack of forage in the operational area. Remember that this ration can vary greatly
4 depending on the situation. Small horses are classed as those usually found in overseas areas. Light horses are
5 those weighing less than 1,150 pounds. Heavy horses are those weighing more than 1,150 pounds.

6 **Feed Components**

7 Types of grains and hay or combinations of available grains and hay will depend on the geographic location of the
8 unit. It is important, however, to come as close as possible to meeting all the nutritional requirements of the pack
9 animals. Some of the grains, hay, and other items that may constitute a ration are described below.

10 **Oats** are the safest and most commonly used of all grains for the pack animal. Usually all other grains are
11 combined with oats or regarded as substitutes. Oats may be safely fed in quantities up to 10 pounds per day but no
12 more than 6 pounds when the animals are idle. Oats may be fed whole or crushed; however, crushing ensures more
13 thorough chewing and digestion. Oats can be steamed or boiled for ill animals but new oats should not be fed until
14 a month after thrashing.

15 **Corn** is best combined with oats and hay for feeding during the colder months since it has a tendency to produce
16 heat and fat. Corn is best fed on the cob, but the animals can be fed shelled corn if it is mixed with oats or bran.
17 When feeding ear corn, 6 to 12 ears are recommended depending on the amount of work being performed and the
18 individual animal. If substituting corn for oats, make the change gradually. Take care because corn is considered a
19 "hot" feed. That means it contains greater than 16 percent protein. If the change is made too quickly or the animal
20 is fed too much, it could lead to colic or founder (lameness). Substitute about two pounds of corn for an equal
21 quantity of oats weekly.

22 **Barley** is used extensively in Asia, Southeast Asia, and parts of Europe. It is considered a good grain and may be
23 safely substituted for oats and fed in the same quantities. The change from oats to barley should be made gradually
24 over an extended period, substituting two pounds of barley for an equal amount of oats weekly. Barley is very hard
25 and should be crushed or soaked in water for two to three hours before feeding, but it may be fed whole. Barley is a
26 "hot" feed and the same care taken with corn must be taken with barley.

27 **Rye** is not regarded as a very good feed for horses and mules. If other feeds are scarce, it may be mixed with other
28 feed such as oats or bran when necessary. Rye is very hard and should be rolled or crushed before feeding.

29 **Wheat** alone is not a safe feed for horses. It should be rolled and combined with a bulky grain or mixed with chaff
30 or hay before feeding. One or two pounds should be given at first and the amount gradually increased to a
31 maximum of six pounds per day.

32 **Bran** is the seed husk of grains such as wheat, rye, and oats, separated from the flour by sifting. It is an excellent
33 food for the pack animal. Bran, having a mild laxative effect, is most useful as a supplement to a ration consisting
34 largely of grains. It helps in building bone and muscle, has no tendency to fatten, and adds to the general tone and
35 condition of animals. To supply the desired laxative and tonic effect, add necessary bulk, and stimulate more
36 thorough chewing, feed about two pounds of dry bran mixed with oats or other grain every day.

37 **Rice**, that is, rough rice, when rolled, crushed, or coarsely ground, may be fed in quantities up to one-half the grain
38 ration. In an emergency it may be fed in quantities up to eight pounds daily.

39 **Grain sorghum** has a general food value of slightly less than that of corn. Feed the pack animal the same amount
40 of grain sorghum as you would feed corn and under the same circumstances. Grain sorghum is less fattening than
41 corn and has a higher protein content.

42 **Salt** is essential to the health and well-being of all animals. The pack animal's need for salt is greatly influenced by
43 the amount and type of work he is performing since a considerable amount is excreted in his sweat. A supply of
44 salt, adequate to replace that lost through sweating, is an important factor in preventing heat exhaustion during hot
45 weather. Salt should be supplied at 8/10 of an ounce per day either by salt block or by mixing it with the grain. If

1 salt blocks can be used, they should be placed where the animals have free access to them. The availability of a salt
2 block eliminates the requirement to add salt to the feed.

3 **Hay** is the basic element of the ration that provides the bulk necessary for the proper performance of the digestive
4 system. The pack animal should not be deprived of hay or something with similar bulk, such as straw, for any
5 considerable length of time. Animals will suffer more on a ration of grain than on one of hay alone. Should the
6 supply of hay normally required for the daily rations be diminished, the animals should be grazed or fed such
7 roughage as can be gathered or produced locally. Oat straw is one of the best substitutes for hay if the oat heads are
8 still on it. Otherwise, it is not a good substitute. Any straw, not spoiled, may be used, but barley and rye straw is
9 not recommended. Do NOT feed wet hay to the animals because it can cause compaction in the intestines and may
10 lead to colic. Do NOT feed moldy hay to horses and mules; cows can eat it without suffering ill effects, but horses
11 and mules cannot. Not having bulky feed, give the animals green or dried weeds or leaves as substitute roughage.
12 All hays, except for the legumes, have nearly equal feeding values. Some of the more common hays are alfalfa,
13 timothy, prairie, and grain.

14 **Alfalfa** is a protein-rich roughage of high nutritive value that more closely approximates that of grains than the
15 common roughage. Alfalfa is an excellent source of calcium and vitamins. Being high in protein, alfalfa combines
16 well with corn to create a laxative effect. When changing to a ration containing alfalfa, do it gradually; give about
17 two or three pounds daily. It should compose not more than one-half of the hay allowance. Because of its high
18 protein content, alfalfa is not desirable for hot weather use.

19 **Timothy** is usually considered the standard hay, although it is not particularly rich in digestible nutrients. Timothy
20 mixed with clover gives a higher nutritive value and a better supply and balance of minerals and vitamins.
21 However, the clover content should not exceed 50 percent. This mixture is common in areas where timothy is
22 available, as timothy and clover are frequently seeded together.

23 **Prairie** hay, or wild hay, is produced from the natural grass growing on prairie land. Upland prairie hay, its
24 feeding value being slightly higher than timothy, makes an excellent hay when properly cured. Midland prairie
25 hay, which is produced from coarser wild grasses growing on low land, is of lower feeding value and is not
26 considered desirable.

27 **Grain** hay is made from oats, wheat, and barley, cut before maturity, and cured in the same manner as other hay. It
28 has a nutrient value about equal to that of timothy but is richer in protein. Care must be taken when feeding grain
29 hay because it may have high amounts of oats still in it.

30 **Grazing**

31 Grazing alone can maintain idle animals satisfactorily. It provides good feed and moreover provides exercise for
32 the animals. As with any change in feed components, grazing periods should increase gradually over the first few
33 days to condition the animal's digestive system. For pack animals in the field, grazing is an important source of
34 roughage and should be used at every opportunity to reduce the consumption of hay, which may be difficult to
35 obtain or be of questionable quality. It also reduces the load that must be carried by the unit. Grazing on wet or
36 frosted alfalfa or clover should be avoided to prevent gas colic. Except in an emergency, Johnson grass and grain
37 sorghum should not be grazed.

38 **Pellet Feed**

39 This type of feed has several advantages over conventional hay or grain rations. Storage requirements are
40 decreased, it is easily deliverable by air, and nutritious by-products can be included. Total feed intake is usually
41 increased when pellets are fed. One disadvantage is that the cost is higher than conventional feeding. Another
42 disadvantage is the tendency of the animals to begin wood chewing or tail biting, but this problem is avoided if the
43 animals are fed roughage in conjunction with the pellets. The contents of a pelleted feed should be selected
44 according to the type of roughage being fed. Alfalfa, for example, provides more protein and calcium than grasses
45 such as timothy and orchard. Consequently, the protein and calcium content of the pellet should be lower.

Water

Drinking water as a feed component is of utmost importance. The nutrients of the feed must be in a solution before they can be absorbed. During work, sweating and other physiological functions greatly deplete the water content of the body's tissues. To compensate for this loss, the body draws from the digestive tract. A deficiency of water in the digestive tract not only affects digestion but may affect the general health of the animal by causing such problems as colic and debility. An animal can survive for a considerable time on water alone but succumbs in a few days if deprived of water.

FEEDING IN GARRISON

The times of feeding and watering while in the operational base or rear area should be fixed and regular. Feeding and watering, both as to time and amount, are based on the training, conditioning, and work being performed.

Watering the Animals

It is important to offer the animals water and give them plenty of time to drink before feeding time. Normally, a pack animal requires about eight gallons of water per day. However, the temperature and amount of work being performed will determine water requirements. The animals should be watered three times per day under normal conditions and four times per day when operating in an extremely warm climate. Under ideal conditions, water should be available to the animals at all times when they are not being used. Feed should not be distributed while the animals are being watered because they will not water properly when they have feed available. If the animal drinks immediately after feeding, the food in the stomach only partially mixes with the gastric juices, causing digestion to be incomplete. The flow of water through the stomach then washes a considerable portion of the stomach contents into the bowels. A loss of nourishment and indigestion or colic may result. Water may be given approximately one hour after feeding.

Quantity and Frequency of Feeding

The stomach of the horse and mule is small and is unable to function properly while holding large quantities of food. Once the stomach is two-thirds full, the feed will pass through the stomach at the rate it is taken into the mouth. Therefore, the stomach functions properly when it is two-thirds full. If the animal is fed too much at one time, the stomach may become excessively distended and feed will be wasted by not being properly digested. A feed of three to four pounds of grain represents the approximate amount an average animal should be fed at a single meal. This feeding may be followed by a long and slow consumption of hay. Under these conditions the gradual passage of food into the intestines then takes place under favorable conditions. If the total amount of grain is increased, it is better to increase the number of feeds rather than to increase the size of the ration at each meal.

Working After Feeding

Working an animal hard after a full feed interferes with its ability to work and with its ability to digest the feed properly. The animal's ability to work is hampered by difficulty in breathing, which is caused by the swelling of the stomach and bowels against the diaphragm and lungs. Digestion is also accompanied by an increased flow of blood and secretions and increased muscular activity in the bowels. Hard work diverts blood to other parts of the body, tires the intestinal muscles, and reduces secretions needed to aid digestion. As a result, the animal suffers a loss of nourishment from the feed, may develop serious disorders of the digestive tract, and may die. The animals may be worked safely one hour after feeding.

Feeding After Working

The digestive organs of a tired animal are just as fatigued as the rest of the body. Therefore, a tired animal should not be fed a full ration. Most of the blood supply is still in the muscles, the muscles of the digestive tract are tired, and the glands used to secrete digestive fluids are not ready to function properly. The animal must be cooled and rested before feeding. Give the animal small amounts of water at frequent intervals and permit him to eat long hay. After about 30 minutes of rest, give him a small portion of grain followed by the balance, a little at a time, after an hour or more. Failure to take these precautions frequently results in colic, laminitis (lameness caused by swelling of

1 the feet), or both. The method of feeding just mentioned is time consuming. If it is not possible to use that method,
2 feed the animals once after waiting one to two hours after work.

3 **Feeding Procedures**

4 Feeding a small amount of hay before feeding grain stimulates an increased flow of saliva and gastric juices, takes
5 the edge off the appetite, and quiets the nervous animal. In the morning, it is not necessary to feed hay first because
6 the animal has probably been eating hay all night. An ideal way to feed hay is to keep it before the animal
7 continuously by replenishing the supply frequently with small quantities. Feeding chaff with the grain adds bulk
8 and forces the animal to eat more slowly, ensuring more thorough mastication.

9 **FEEDING IN THE FIELD**

10 Feeding pack animals away from garrison in a field or combat environment presents problems that are not present
11 in garrison. The greatest problem is setting a regular schedule of feeding times. The hours animals are worked in
12 the field or under combat conditions are seldom the same every day. Therefore, to adhere to the principles outlined
13 above, the animals must be fed smaller rations at more frequent intervals. It is very important to ensure every
14 animal is fed a full ration every day to maintain the strength required to work in the field.

15 Due to logistic constraints, there may not be enough hay available to ensure the animal receives the required
16 roughage. In this case, the animal must be allowed to graze at every opportunity to obtain sufficient roughage.
17 Grazing should be allowed while at a bivouac location and at halts while on the march. A halt of an hour or more
18 to feed grain should be planned if the duration of the movement will exceed five hours. Important points to
19 consider when feeding in the field are covered below.

20 **Watering on the March**

21 Watering on the march should be done whenever possible, especially on hot days. When watering a string of
22 animals on the move, such as at a stream crossing, allow the entire string to get in the water before letting any of
23 the animals drink. Otherwise, the lead animals will drink and then try to move down the trail before the rest of the
24 animals in the string have had a chance to drink. Watch to ensure all animals have had the opportunity to drink
25 before moving the string. Angle the string upstream so the animals ahead do not foul the water. Give the animals
26 ample opportunity to drink their fill and not be led away the first time they raise their heads. After watering, keep
27 the animals at a walk for 10 to 15 minutes before increasing the gait or coming to a long halt. This action will
28 prevent digestive disturbances.

29 **Feeding Halts**

30 Try to plan the place for a feeding halt two or three miles past a watering point. Give the animals a little hay after
31 arriving at the feeding point and tying them to the night line. This procedure will help relax the animals and start
32 the secretion of the gastric fluids.

33 **Feeding at Bivouac**

34 When it is necessary to feed and water at a bivouac location, wait at least 45 minutes after arrival to water the
35 animals. Remove the bits if a full watering will be allowed. When watering at the bivouac location, an individual
36 should lead the animals to the water on foot. A person should not lead more than two animals at a time. When they
37 are drinking, he should stand between the animals so they do not crowd each other. As stated before, the animals
38 should be given ample time to drink and should not be led away from the water the first time they raise their heads.
39 The animals should go to the water and leave the water together. Watch that the animals do not start pawing the
40 water or lie down in it after being watered, as they often do. These actions will stir sediment on the bottom and
41 make the water unfit to drink by other animals.

Water Shortages

When water is scarce, its consumption will have to be regulated. If the bits are removed, animals can drink from a very shallow container. A small quantity will let an animal keep moving if you give the water by the swallow instead of allowing him to take one long draft.

Feeding Hay

When the animals are on a night line, break the hay from the bales and distribute it along the night line. Feed the hay in small quantities and replenish it frequently. This procedure is especially important in damp climates or while it is raining. If the rain is expected to be continuous over a long period of time, it is best not to feed hay at all. Feeding damp hay will cause serious colic in the animal, and moldy hay should never be given. As mentioned before, cattle can eat moldy hay without problems, but horses and mules cannot. Wait until the rain is finished. Break the bales of hay apart and distribute only as needed. Personnel should ensure the animals do not work the hay beneath them where they cannot get to it.

Feeding Grain

When feeding grain in the field, feed the animals from a feedbag and ensure the feedbags fit properly. If they are too loose, the animals will toss their heads trying to get to the feed and grain will be spilled and wasted. Watch the animals while they are feeding from a feedbag, and never allow them access to water until they have finished eating and the feedbags are removed. They could get the feedbag filled with water while attempting to drink and drown. To conserve feed, spread any feed left in the feedbags on a cloth to dry. The feed can then be used for the next feed. Grain should not be spread on the ground for the animals to eat. When the animals eat it, they also ingest dirt, which can lead to colic. Any grain spilled on the ground in front of the animals should be swept.

CARE OF FORAGE

The care of forage is extremely important to the health of the herd. Feeding damp or moldy hay can cause colic and could disable a large portion of the herd at once. Inspect the forage at the time of delivery to ensure the quality of it. In garrison, shelters are available to keep the forage dry. In the field, make every attempt to keep it dry. When the feed is packed on animals for transportation, cover it with a manta. This precaution will protect the feed from the elements and keep the animals from getting into it during the movement. During temporary storage, raise the forage off the ground by timbers (or whatever else is available) and cover it to keep it from getting wet and keep loose or stray animals from getting into it.

CHAPTER 3

ANIMAL CARE AND TRAINING

The proper care and training of pack animals is essential to the health of the animals and their performance in the field. Without proper care, the animal's health and the unit's ability to complete its mission will suffer. Without proper training, the unit cannot rely upon the animal to behave in a manner that ensures mission accomplishment.

GROOMING

Grooming is essential to the general health, condition, and appearance of animals. It also provides an excellent time to inspect them for injuries. When grooming before movement, check the animals for injuries. Also, check the condition of past injuries, if any, at this time. When grooming after movement, check the animals for injuries sustained on the trail and for any evidence the saddle or harness may have chafed the animal. These precautions permit treatment of any problems before they get to the point of incapacitating the animal. The value of grooming depends on how thorough the handler does it. The animal handler obtains efficient grooming when he takes pride in the appearance of his animals.

When to Groom

The animal handler should groom every animal thoroughly at least once each day. Always groom an animal before leaving the stable area for work or exercise. Before saddling the animal, be sure the area where the saddle pad and cinch ride are free of dirt and foreign objects. Failure to clean these areas will result in sores and could cause the animal to be unusable. On return from work or exercise, remove, clean, and put away any equipment. Cool a heated, wet, or sweating animal before grooming it. Give it a brisk rubbing with a cloth to partially dry the coat, then blanket the animal (if a blanket is not available, leave the saddle pad on) and walk it until it is cool. Check for injuries that may have occurred during movement.

Equipment

Each individual, responsible for the care of animals, should have a grooming kit. The basic kit consists of a currycomb, horse or body brush, hoof pick, and a grooming cloth (Figure 3-1).

Currycomb	A circular metal device with sawtooth-like edges used to remove caked mud, to loosen matted or dried skin and dirt in the hair, and to clean the body brush while grooming. Never use it on the legs below the knees or hocks and never use it about the head.
Horse or Body Brush	The main tool used in grooming. When used properly, the bristles of the body brush penetrate through the hair of the coat and remove dirt and flaked skin from the hide as well as from the hair. Various body brushes are available. Generally, it is better to use a stiffer bristle to penetrate the hair on the coat better.
Hoof Pick	A small metal pick used to clean rocks and packed dirt from the hooves.
Grooming Cloth	A cloth used to clean the body orifices and to give a final polish to the coat. The handler can make a grooming cloth, about two feet square, from old toweling or any other type of soft cloth.

Figure 3-1. Grooming kit.

Grooming Sequence

A prescribed sequence of grooming will enable the animal handler to groom effectively and thoroughly. The following paragraphs explain the recommended sequence.

1 Check the animal for any signs of lameness as you walk it to the grooming area. If any exist, thoroughly clean the
2 hoof of the affected leg with the hoof pick and look for rocks or other debris causing the problem. Each hoof does
3 not need cleaning every day in working animals. One school of thought is that the soft dirt and debris packed in the
4 hoof gives the animal extra cushion to walk on in rough terrain. Whether cleaned daily or not, the handler should
5 check the animals' feet for thrush, torn frog, loose or missing shoes, and cracks. Report defects at once to the
6 medic or veterinarian.

7 Take the currycomb in the right hand and the brush in the left. Go over the left side of the animal with the
8 currycomb beginning at the neck. Continue down to the breast, withers, shoulders, foreleg and knee; then smoothly
9 transition to the back, side, belly, croup, and hind leg to the hock. Strike the currycomb frequently against the heel
10 or side of the brush to free the accumulated dirt and dried skin. Ensure the currycomb follows the natural lay of the
11 hair.

12 Brush the entire left side of the animal in the same order as above except brush the legs down to the hoofs. After a
13 few strokes, clean the brush with the currycomb. In using the brush, stand well away from the animal, keeping
14 your arm stiff, and throw the weight of your body behind the brush. A twist of the wrist at the end of each stroke
15 will flick the dirt away from the hair. Ensure the brush follows the natural lay of the hair. This use of the brush is
16 not necessarily a separate activity from currying; you can do both at the same time with a brush stroke following
17 each currycomb stroke.

18 Pass to the right side of the animal, change hands with the brush and currycomb, and groom the right side in the
19 same order as above.

20 Brush head, mane, and tail. In cleaning the mane and tail, begin brushing at the ends of the hair and gradually to
21 the roots, separating the locks with your fingers to remove dried skin and dirt. Wipe eyes, nostrils, and lips and rub
22 the head, ears, and muzzle with the grooming cloth. Clean the dock (fleshy part of the tail) and give a final polish
23 to the coat.

24 ***NOTE: As a precaution against the spread of skin diseases, wash grooming equipment and drying cloths with***
25 ***soap and water once a week.***

26 **Animal Inspection**

27 Inspect the animals, as indicated above, while grooming them. Good grooming offers the opportunity for close
28 examination of the animal and the discovery of injuries or defects that otherwise might pass unnoticed. Correcting
29 or treating these defects or injuries greatly reduces the number of non-effective animals in a unit. Along with
30 wounds or other injuries present, there are others that are not immediately visible to the naked eye. For example,
31 you can check for sore kidneys by placing your hand on the animal's back at the withers. Apply pressure with the
32 thumb and fingers on either side of the spine as you slide your hand along his back, toward the tail. If the animal
33 flinches, as you get to the area just to the rear of where the saddle rides, it is a sign that his kidneys are sore. This
34 might result from poor saddle placement or improper riding position.

35 **Grooming Sick Animals**

36 Do not groom animals that are sick, weak, or depressed. They should be hand-rubbed at least once a day. Wipe
37 their eyes and nostrils out with a damp sponge or soft cloth and clean their feet. Groom animals with minor
38 ailments in the usual manner. Do not clean animals with tetanus at all.

39 **FARRIER SCIENCE**

40 While not farriers, individuals must be able to replace, at least, a loose or missing shoe when they are not available.
41 The usefulness of a pack animal depends on the health and condition of its feet. The feet of a normal animal, due to
42 their structure, require very little care or protection while on free pasture or even under light working conditions. At
43 moderate work levels on good footing, an animal may require no more than cleaning and periodic rasping to trim and
44 level its feet. The hind feet need only moderate care since they receive less shock. The front feet carry 60 to 65
45 percent of the load. As the workload increases or the terrain becomes more difficult, the animal's feet require

- 1 additional care and protection. Shoeing protects the feet from excessive wear and enhances balance, support, and
- 2 traction.

Basic Shoeing

Hoof growth, shoe wear, and the work required of the animal governs the frequency of shoeing. On the average, shoes may remain on the animal without change or adjustment for one to two months, though three to four months wear is occasionally possible. A farrier does the routine refitting. However, all handlers should have a basic understanding of the shoeing process, and several in each unit can replace or refit a lost or outgrown shoe.

Farrier Tools

A farrier's kit should contain pincers, a pritchel, clench cutter, hoof knife, hoof nipper, hoof rasp, blacksmith and driving hammers, clincher, and fencing pliers (Figure 3-2).

Pincers	Used to remove the shoe from the hoof, cut off excess length of clinches, or remove improperly driven nails.
Pritchel	Used to enlarge the nail holes on shoes or to assist in extracting re-usable nails from shoes.
Clench Cutter	Used to cut or straighten the nail clench before removing the shoe. The handler uses the blade end for that purpose. He can use the other end as a pritchel.
Hoof Knife	Used for cutting excess horn from the sole of the hoof and for trimming the frog, if necessary. It is available in right- and left-handed models.
Hoof Nipper	Used to remove the excess growth of wall from the hoof when preparing to replace or refit a shoe.
Hoof Rasp	Used to remove excess hoof wall and to level the bottom surface of the hoof. The rough rasp is a hoof rasp that has become dulled. The handler can use it to remove the burr under the clinches and to smooth the clench after the shoe has been replaced. He can also use the rough rasp to file away the clinches when removing a shoe.
Blacksmith Hammer	Used to shape the shoes to the animal's feet.
Driving Hammer	Used for driving the nails that secure the shoe to the hoof and for forming the clinches.
Clincher	Useful in finishing the clinches, especially when working on young or lame horses that object to having their feet struck with the hammer.
Fencing Pliers	Have several uses in the farrier kit. The handler can use them as a hammer or for cutting nails and many other functions in caring for animals' feet. He can also use them to repair saddles and harnesses.

Figure 3-2. Farrier tools.

Raising and Holding the Foot

It is important to know the proper way to raise and hold an animal's foot before doing any farrier work so that you can control the animal and have both hands free to work. Working with the front and hind legs is slightly different.

Front Foot. To raise a front foot, face the rear and place the hand nearest the animal on its withers and talk to it. Run your hand down the animal's shoulder and leg to the tendon in the back of the leg just above the hoof. Grasp the tendon between your thumb and forefinger and squeeze slightly.

1 Allow time for the animal to lift his foot, then slip your hand around and lower on the leg until you are cradling
2 the hoof in the palm of your hand. Move closer to the animal and pass his foot behind your knee nearest the animal
3 and into your other hand, which has been passed between your legs to receive it. To free both your hands for work,
4 press your legs together just above the knees.

5 Do not raise the animal's foot too high or too far away from his body. Stand with a pigeon-toed stance, bend your
6 legs, and keep your back straight. This posture will free you to work with both hands. While you are working on
7 the animal's leg, you should be very aware of things around you so that you can predict the intentions of the
8 animal. Unless suddenly frightened, an animal is quite predictable about wanting his feet on the ground. When an
9 animal is getting a little tired and wants the front leg down, he will test your grasp of his leg with a few jerks. If he
10 is going to hop on his other foot to get away, he will invariably move forward slightly with both hind feet in
11 preparation for this move.

12 The farrier should not let an animal take his leg away every time he wants it. Be considerate of the animal, but do
13 not let the animal be the boss. The animal will soon get the idea that he can set his foot down as he sees fit, which
14 can be dangerous.

15 **Hind Foot.** To raise a hind foot, face the rear, place your closer hand on the animal's withers and stroke it across
16 the back to the hip, then down the hip and leg to the fetlock. Grasp the fetlock with your fingers. Draw the leg
17 toward you. The animal will shift his weight and pick up his foot.

18 With one fluid motion, slide into position by moving toward the raised leg and put the leg in your lap. Your leg
19 (the one nearest the animal) presses against the inside surface of the fetlock joint, your outer leg holds the other
20 side of the fetlock. The animal's cannon bone presses against your ribs, with your upper arm, while the tibia rests
21 upon your hip.

22 An animal will indicate when he wants his hind leg down. He will "cock" his leg by drawing it forward and
23 upward toward his stomach, as if to "cowkick." If he does not cock his leg, he cannot kick with any force.

24 Shoe Removal

25 To replace a shoe that has not come off the animal, you must follow a specific sequence to correctly remove the old
26 or damaged shoe.

27 Look at the hoof approximately 1/2 to 5/8 of an inch from the shoe. You should see where the nails holding the
28 shoe have come out of the hoof and are bent over or clinched. Using the clinch cutter and driving hammer, cut or
29 straighten the clinches of the nails holding the shoe in place. Place the blade end of the clinch cutter under the nail
30 point and tap the other end with the driving hammer. You can also use the rough rasp to accomplish the same
31 thing by filing down the clinches.

32 Pull the shoe by wedging the cutting edges of the pincers between the shoe and hoof at the heel and then exert a
33 quick thrust toward the toe. Repeat the procedure, alternating from one side of the shoe to the other, progressing
34 toward the toe until the shoe is removed. Once you remove the shoe, check to see if all the nails came out with the
35 shoe. If they did not, check the hoof to see if any nails remain. Remove any remaining nails with the pincers.

36 Hoof Preparation

37 Using the hoof pick (found in the grooming kit), thoroughly clean dirt and debris from the hoof. Then pare away
38 the dead horn over the white line with the hoof knife. Do not touch the frog unless you cannot insert a hoof pick
39 between the bars of the frog. In such a case, narrow the frog slightly, but try not to involve the surface touching the
40 ground. Be careful not to remove too much of the frog. Cutting the frog too deeply could result in excessive
41 bleeding and disability of the animal for a long time. Level the foot with the rasp. Use long, smooth strokes from
42 heel to toe. Be careful not to use too much rasp pressure when passing over the heel. You can always take off a
43 little more heel later, but you cannot replace what has been removed. Do not expose live horn except over the white
44 line and the outer border of the sole; the animal needs a covering of dead horn to protect the sensitive sole against
45 bruising. Be sure to leave the bars intact as cutting away these structures can cause contraction of the heels and
46 quarters. Sight across the hoof to see that the surface is flat.

Shoe Replacement

Fit the shoe to the hoof by holding it so that you can see the white line through the nail holes. See that the shoe lays flat on the hoof surface without rocking. Eliminate any wobble between the shoe and hoof by rasping the high spot on the hoof. You may have to bend or shape the shoe as needed since it may have become deformed if it was worn loose for a time. Do not worry about the excess hoof wall in front of the toe of the shoe. You will rasp the excess away later in the shoeing process.

Secure the shoe to the hoof with nails and the driving hammer. You should bevel the horseshoe nails near the point so that they will turn out of the hoof when pounded into it. The other side of the nail is flat. Always place the flat side of the nail so that it faces the outer edge of the hoof. You can be sure the nail is facing the right way by looking at its head: there is checkering on one side of the nail head. The checkering should always face the inside of the hoof. Grasp the nail between your thumb and forefinger and make sure the flat side of the nail faces the outer surface of the hoof. Place the point of the first nail through the third nail hole on one side of the shoe, pointing parallel to the horn fibers of the hoof. Tap the nail lightly several times to start it into the hoof wall.

To force the point of the nail through the outer surface of the wall at the desired spot, continue to apply light blows until the nail is driven approximately two-thirds of the required distance. You should then apply one sharp heavy blow on the head of the nail to force the point through the wall. The bevel on the point of the nail is effective only when driven rapidly through the horn. If the animal twitches or jerks away at any time during the nailing, pull the nail and check for moisture or blood on it. The nail should exit approximately $\frac{3}{4}$ of an inch above the ground surface of the foot to sufficiently hold the shoe. If there are old nail holes in the wall, the new nails should emerge at least $\frac{3}{8}$ of an inch from the old holes. This length puts the new nails in hoof fibers strong enough to properly hold the nail. After the point emerges and you drive the nail head solidly into the crease of the shoe, immediately remove the point of the nail. Do this quickly to avoid serious injury to you should the animal decide to pull his leg away suddenly. To remove the point of the nail, point the claws of the hammer toward the toe of the hoof. Place the claws onto the nail point as deep as possible and close to the hoof wall, bend the nail straight out from the wall, and rotate the hammer. This procedure will “wring” off the point and excess length of the nail. Repeat the process with the same hole on the opposite side of the shoe.

After you drive in two nails, check the shoe to ensure it still fits properly. You can adjust the fit by tapping lightly with the hammer to move it into place. Then put the remaining nails in the shoe. You may find it easier to “start” the first nail on each side of the shoe before driving either of them all of the way. “Set” the nails by striking the heads sharply with the driving hammer. Make sure you hold a solid metal object (such as the flat side of the pincers) firmly against the end of the nail that protrudes through the hoof when you strike. Some farriers think that the order in which you set the clinches is very important. The recommended sequence is to set the two nails nearest the toe on the opposite side, then the quarter and heel nail on the first side, followed by the remaining heel nail. Cut off the nail points with the pincers. Leave enough length for a proper clinch. The clinch should be approximately $\frac{1}{8}$ of an inch long. A clinch that is too long can cause the wall to break should the shoe become caught on something and pulled off. The wall fibers of the hoof will break when the nail emerges. Remove the resulting burr under the seated clinch with the file side of the rough rasp. Be careful to file away only the burr. Do not file a deep groove around the hoof; make it just large enough to contain the clinch. Use the clincher to bend the clinches down into the groove.

Once again, take the pincers and the hammer to finish forming the clinch. Hold the pincer jaws against the head of the nail and strike the end of the nail to seat it even with the wall surface. You should bend the nail abruptly at the hoof wall. Ensure the hammer travels parallel and as close to the hoof wall as possible. You can use the clincher for this step if one is available. The clinches are now finished. Using the file side of the rough rasp, smooth the nails leaving no sharp edges on the wall of the hoof. Rasp and shape the hoof to the shape of the shoe. Most of this rasping will take place in the area of the toe and anterior quarter. Be careful not to rasp too much and rasp away the clinches.

Farrier's Objective

- 1
 - 2
 - 3
- The shoeing process will become more clear when you have seen it done once. Remember, the intent of this section is only to enable you to replace a loose or missing shoe. If possible, you should fit each animal with an extra front

and hind shoe. These shoes, their nails, extra nails, and farrier tools should be part of the standard equipment packed whenever you take the animals out. If a shoe becomes loose on the trail, remove it if possible, to avoid its loss or injury to the animal. It would be ideal to replace lost or loosened shoes immediately, in garrison or on the trail. However, there will be times in the field when it is impossible to replace a shoe before two or more days have elapsed. This delay is typical and may have little or no adverse results. If this situation occurs, reduce the load of the pack animal or have a rider spend more time walking than riding his mount if it is a riding animal.

TRAINING

A pack animal detachment will not always be able to work with animals that are trained and conditioned to pack. Even if the animals are trained to pack, they may need retraining or conditioning. In such cases, you need to know some of the basics of training and conditioning animals. The purpose of this section is to give you enough information to evaluate the level of their training and to train and condition them as necessary for pack operations.

Trainers

The attitude of personnel training pack animals is extremely important. A person assigned to train animals must have a better than average knowledge of animals. He must also have patience, tact, firmness, and a liking and aptitude for animal management. A person who is afraid of animals or who will become frustrated easily with them will not do well. Above all, the trainer must not take out his frustrations on the animal by beating, kicking, or using excessive restraint on the animal. A good animal trainer combines an intelligent respect for animals with a lack of fear.

An ideal animal trainer will be—

- Systematic.
- Patient.
- Tactful and resourceful.
- Moderate.
- Observant.
- Exacting.
- Logical.
- Tenacious.
- Consistent.

Requirements

Previous experience and current abilities will determine the training needs of animals. Along with their physical conditioning, trainers must evaluate the animals on their level of proficiency in leading; packing; riding; picketing; standing; gaitting; swimming; balance; and conditioning to the sights, sounds, and smells of battle. Untrained animals never used for pack purposes will require a complete training and conditioning program.

Exercise and Conditioning

An animal requires good conditioning to perform the work demanded of it without injury to its body and muscular organs. You can acquire and maintain good conditioning through a progressive program of proper exercise and feeding. Objectives of the program are endurance, stamina, a good state of flesh, and resistance to disease. You can attain these objectives only by proper feeding and long periods of conditioning work at the slower gaits, mostly the walk. You must condition both pack and riding animals to carry the weights required in field operations.

Exercise must be regular, graduated, and always within the capabilities of the animal. Working tired or unfit animals can cause accidents. If an animal is idle for a considerable time, you must repeat its process of conditioning. The minimum period of exercise necessary to maintain an animal in working condition is two hours

- 1 daily. Animals need not be maintained in peak condition for field duty at all times. However, they should remain in
- 2 such condition that a

relatively short period of carefully scheduled work will put them in fit condition for anticipated duty. The kind and amount of exercise given to animals depend on the type of work they are to perform, their current condition, and the number of individuals available to exercise them. Although the most satisfactory exercise is gained by assigning one or two animals to an individual, pack units (with limited manpower) will normally have to adopt other methods. Begin any period of exercise with 10 to 15 minutes of walking to ensure good circulation, particularly in the feet. Instead of hard surface roads, try to select dirt roads for exercise because they are easier on the animals' feet and legs. Also, work the animals on trails or cross-country to maintain their fit condition. If you are exercising two animals, try to always ride one out and the other in and lead each alternately on his right and left. This habit will get the animals used to both being led and ridden. End each exercise period with a 10-minute walk to return the animals to the stables dry and breathing normally. The walk is the prime conditioning gait. Walking develops muscle, while trotting improves balance, and galloping develops wind. If you use either of the faster gaits in excess, the animal will lose rather than gain condition. Determine the length of trot periods by the condition of the animals but in no case should you exceed seven minutes. Vary the routes for exercise from day to day so that the animals will not recognize the route and try to hurry back to the stables. Also use different routes to relieve monotony. Try to set up the training and conditioning program according to the amount of time available and the level of proficiency of the animals and handlers.

Program Development

At the beginning of training, animals may be in poor physical condition and unaccustomed to hard work. To properly condition animals, yet avoid injury, ensure operations are long in duration but mild in character. According to the training principles mentioned above, each animal should receive advanced training that includes gentling, leading, riding, standing, packing, gaiting, swimming, and seasoning to battle conditions. Use actual field movements, progressive in length, throughout the training period to build up endurance. Conduct a part of such field movements and other phases of training at night to prepare the animals for night operations. Pay close attention to the animals during night training to determine if any are night blind. Personnel responsible for training animals should know the use of restraining devices for controlling animals. Such devices include the twitch, cross tie, and blinds. Exercise great care, however, in the use of such devices. It is advisable to select the mildest and least dangerous method of restraint necessary to achieve the desired results. Remember, kindness, perseverance, and tact will often accomplish the desired purpose without the need for restraint.

Restraint of Animals. Many ingenious devices have been developed over the years for restraining animals. Some have proven useful and humane and have helped to quiet and train animals. Others, while they temporarily quiet and subdue the animal, make its attitude worse than it was originally. Once you use these methods on an animal, it will get to the point where it is neither gentle nor likely to carry a load. It will start showing many bad habits, such as bucking off the pack load. Remember, use restraints only when needed and use the least amount of restraint needed.

Blinding. This method is the easiest way to restrain an animal. Make sure you tie the animal securely to a tree or post. Then take a piece of cloth (a gunny sack, a jacket) or anything else that you can place over its eyes and tie it around the back of the animal's head. When blinded, an animal will seldom try to move because he will not be able to see.

NOTE: *Under no circumstances should you move an animal, no matter how slightly, while it is blinded.*

Twitches. Animal handlers use twitches because they are the handiest and most common method of restraint. As it shuts off circulation in the lip, never use it continuously for an extended time and never with greater force than is necessary. Make a twitch by running a small piece of rope or rawhide through a hole in the end of a rounded piece of wood two- to five-feet long, such as a pick handle, and tying it in a short loop. Pass the loop of the twitch over the upper lip, which you seize by your hand and draw it forward, taking care to turn the edges of the lip in to prevent injury to the mucous membranes. Then tighten the loop by twisting the stick until you obtain sufficient pressure. Light changes in pressure with increases against resistance and decreases as the reward for obedience will help keep the animal's mind off the reason for the restraint and reduce the need for severity. These changes also

- 1 help in training him to be more controllable. You should seldom use the twitch as a restraint while saddling or
- 2 packing animals. Use the twitch mostly when restraining for medical treatment or shoeing.

Cross Tie. Trainers often use the cross tie as a mild form of restraint. It consists of securing the animal's head in a normal raised position by two tie ropes extending from the ring in the halter to opposite sides of the stall or between two trees. When properly adjusted, you may use the cross tie to your advantage while grooming, saddling, or doing any work around the animal. It also prevents an animal from chewing a wound and from lying down when you need him standing.

Other Restraints. You can use additional types of restraints when treating an animal whose condition is such that complete immobilization of the part to be treated is required. These are used only under normal conditions. Giving tranquilizers makes the more severe restraints unnecessary and reduces the danger to the animal from abuse at the hands of the ignorant or inexperienced. Other restraints include the—

- Side stick.
- Muzzle.
- Knee strap.
- Casting rope.
- Side line.
- Running "W."

Calming an Animal. Fear is one of the animal's strongest instincts. If allowed to remain a dominant instinct, you cannot train the animal satisfactorily to do the work demanded of him. The goal of the trainer throughout the training period should be to gain and maintain the confidence of the animal. Horses and mules have a remarkable memory and tend to remember the unpleasant experiences longer than the pleasant ones. Retraining thus becomes more difficult than initial training, especially with a young, impressionable animal. Rewards for accomplishment are extremely valuable in the gentling process. Patting the neck, rubbing the head, and hand-feeding are good aids in gaining the confidence of the animal. The unwarranted use of whips, switches, or other devices to inflict pain or restraint should not be allowed in training. A willing, confident animal will work to the extent of his physical ability while the scared, reluctant animal will expend less productive energy than his trainer.

Catching an Animal. The most convenient method of catching loose stock is by just walking up to the animal either in a corral or in the field. However, first, you must have gained his trust. Only through love and kindness to the animal will you gain his trust and respect for your presence at his neck. Once you start to catch a loose animal, do not give up just because he walks off or spooks. Do not leave him to go to another animal. If you are not firm, you will soon have an animal that is impossible to catch without either roping or cornering him in a corral. You will have taught him to avoid you by letting him go at the first sign of resistance. Maintain eye-to-eye contact while you are trying to catch a loose animal. The animal often communicates his intentions through his eyes. Also, watch the animal's ears. If they point backwards or cock to one side, you do not have the animal's complete attention and you must have it to catch him. He must respect you above all animals in the immediate area. The head of an animal being caught is not always the first thing a person should touch. Often the middle of the neck or the back area is the best area. Rubbing the animal about the withers and back will enable you to step in close to him and then hook your arm over his neck. Some animals will try to pull away from you at this point. If he pulls away from you more than once, slip the halter rope over his neck when you start to scratch or fondle him. You will then have a loop to hold him. When he starts to move away, stop him firmly. Immediately reward the animal for his obedience with a few reassuring pats and caresses. Do not knock him around for responding to the halter rope around his neck. If you do, the next time you want to catch this animal, you may not be able to get near him. Last, but not least, a little grain in a bucket or feed bag will usually let you catch most animals that are used to being grained. If they get used to being grained immediately after being caught, their anticipation of the grain will make them very easy to catch. Having an apple or carrot to give them after catching them is another way to ensure their cooperation, but be sure to always give it to them. Never tease them with a treat just to coax them into getting close enough to catch, then not give it to them. As mentioned before, horses and mules, especially mules, have good memories and will not forget such an insult.

Breaking to Picket. Picket breaking is an important thing to teach animals to ensure against halter pulling. If you picket break an animal before attempting to saddle or pack him, the impression of secure fastening will never leave him. He will feel that any strain put on the halter or halter shank is useless. Trainers have used the following method for picket breaking successfully for many years. It saves time and labor, since the animal does most of the work, and seldom has to be repeated. Catch the animal and put a strong halter with a large halter ring around his neck. Get a good, strong, soft rope, one inch or more in diameter. Run one end through the halter ring and tie a fairly snug bowline around his neck. Tie the other end securely to the middle of a smoothly trimmed log approximately 12 inches in diameter and approximately 20 feet long. Place the log in the middle of a smooth, open piece of ground where the animal will not be able to become entangled with anything except the above-mentioned equipment. If no logs are available, use something like a large truck or tractor tire. The animal may pull, tug, and jerk on the log and try everything he can think of to get away from the log but without success and without harm to himself. Soon the animal will learn that it cannot go anywhere and that a halter and rope mean escape is impossible.

Training to Stand. You should teach an animal to stand still when the lead rope is hanging. Trainers call this kind of restraint a "ground hitch." Breaking to a ground hitch will prevent an animal from straying or running away if he comes loose from the pack string. One way to train an animal to stand with the lead rope hanging down is to run the lead rope through a ring attached to a spike in the ground. Place a set of hobbles on the animal and run the lead rope through the ring and then tie it to the hobbles. When the animal tries to move, he will not be able. He soon learns he should stand still when the lead rope is hanging.

Leading. You must teach all animals to lead. First teach them to lead next to a dismounted packer. Then teach them to lead alongside well-broken animals. Leading should be at the walk, as daily exercise, until the new animals lead quietly and have improved sufficiently in condition to allow them to start their instruction under saddle.

Riding. You should break all animals to riding and ride with regularity during training before initial work under the pack. Since the mouths of young or untrained animals are tender, you should not use bits during the initial riding periods. Attach the reins to the halter or use a hackamore.

Packing. After the animal has been ridden for about 10 days, you can mount a pack saddle on him. For the first few days, do not load the pack saddle. Ensure the animal is thoroughly familiar with the method of saddling and unsaddling. Also make sure he stands quietly while packers are working before you place any load on the saddle.

Training under load should be progressive. Initial loads should be light, single-side loads such as sacks of oats. Do not attempt to condition the animal for top loads until he is completely conditioned for full side loads. When the animal is comfortable with this weight, add top loads to the side loads. Gradually increase the load from day to day until the animal is carrying his full payload of from 200 to 250 pounds. After you train the animal to stand, train him to stand while being saddled and packed. If at first he does not stand quietly, you may need to use the blind. As mentioned before, the blind is an exceptional aid and you should only use it when the animal clearly indicates the need. Never move an animal a single step while blinded.

Gaiting. Animals individually led by dismounted drivers maintain a rate of march of from 3 1/2 to 4 miles per hour and seldom move at a gait faster than a walk. Those led by mounted drivers may be required to take any gait demanded by the situation. The walk and amble are the most satisfactory gaits for mules. The animals can maintain the walk for long periods at 4 miles per hour (a natural gait for the animal) and tend to disturb the load less than any other gait. The amble is an acquired gait, easily acquired by the mule, that increases the rate of march to slightly over 5 miles per hour. This gait is also easy on the load and hitches and, due to the increased rate of march, is favored over the walk on fairly level going. Trainers teach the amble to pack mules by increasing the rate of march gradually during the training period. In hurrying to keep up to the column, mules will first break into the amble for a few steps. These periods at the amble will gradually increase until they become confirmed in this gait.

Swimming. Trainers must teach pack animals to swim boldly and freely. Although they are naturally good swimmers, some animals are initially afraid of the water and will resist entering it. When they do go into the water, such animals fight their environment and swim very poorly. Introduce the animals to the water quietly, coax

- 1 them to wade through shallow water at first, and then lead them into increasing depths gradually until they must
- 2 swim.

Known good swimmers should accompany the green swimmers during this phase of training to give confidence to the novices.

Battle Indoctrination. Trainers should try to mentally condition their pack animals to as many of the sights, sounds, and smells of combat as possible. Once the animals become accustomed to these sensations, you can feel assured about their docility and good conduct in the field. Trainers must conduct this mental conditioning or battle indoctrination, so that animals will not associate the sight, sounds, or smells with harm or pain to themselves. Following are some tips:

- Conduct a portion of the training in marching, packing, and unpacking close to motor parks. The animal will then be subjected to the—

⇒ Sounds of motors being started and warmed up.

⇒ Pounding of metal on metal and an occasional backfire.

⇒ Smells of exhaust fumes and raw fuel.

⇒ Sight of many types of vehicles, both moving and at rest.

- Lead the animals as close to active firing ranges as safety will allow, near rail yards and crossings, and in areas near operating airfields. These areas get them used to loud, sharp sounds and the sight of flying aircraft. Another way to accustom the animal to gunfire is to crack a bullwhip near it.

- Place cans containing pebbles, boxes of tin cans, or other noisy cargo on the loads so that creaks, rattles, and unusual noises generated on the load will not “spook” the animal.

- Subject the animals to such odors as iodine, ether, smoke, gasoline, disintegrating flesh, and rotting vegetation.

Training for Balance. Units normally use pack animals when crossing over terrain that is impassable by any type of motor vehicle. Traversing such ground requires a well-developed sense of balance. The mule naturally has a fine sense of balance. However, saddle and load will interfere with his natural balance unless he has some training under load over difficult terrain and learns to adjust to the actions of this dead weight on his back. Train the animal on terrain that is as similar as possible to the terrain in the operational area. Make him cross extremely narrow bridges, fallen trees, and ditches. Work him on steep, narrow trails, corduroy roads, over swamps and boggy areas, and along rocky slopes where you must select safe footing among loose stones. Trainers should use judgment in handling pack animals on difficult terrain, and they should avoid interfering with their natural balance. The mule, if left to himself, usually shows better judgment than the average handler. Therefore, let the mule pick his way through the very difficult terrain.